

Remarks

Claims 1-15 have been cancelled without prejudice, and claims 16-25 have been newly added. As a result, claims 16-25 remain pending in the present application. Support for the amendments is found in the specification and claims as filed. Accordingly, the amendments do not constitute new matter. Reconsideration of the application in view of the foregoing amendments and following comments is respectfully requested.

Claim Rejection - 35 U.S.C. 112, Second Paragraph

With respect to Paragraph 1 of the Office Action, the Office Action rejected claims 1-15 under 35 U.S.C. 112, second paragraph, as being indefinite. Specially, the Office Action stated that these claims are rejected for being unclear as to how the thickness variation of a film structure is controlled in the process steps.

Claims 1-15 have been cancelled and claims 16-25 are newly added to eliminate the problem mentioned by the Office Action. Applicant respectfully submits that no new matter has been added and the Office Action's rejection under Section 112 is overcome.

Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejection - 35 U.S.C. §103

With respect to Paragraph 2 of the Office Action, the Office Action rejected claims 1-4 under 35 U.S.C. §103(a) as being unpatentable over

Gilbert (US 5,885,856). With respect to Paragraph 3 of the Office Action, the Office Action rejected claims 5-15 under 35 U.S.C. §103(a) as being unpatentable over Gilbert (US 5,885,856) and in view of Huang (US 5,895,254).

Claims 1-15 have been cancelled without prejudice, and claims 16-25 are newly added. Accordingly, applicants respectfully request that the rejections be withdrawn.

When applying 35 U.S.C. §103, the following tenets of patent law must be adhered to:

(A) The claimed invention must be considered as a whole;

(B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and

(D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). (MPEP §2141)

In *Gilbert*, a pattern of dummy structures 20 are added to the layout pattern of an integrated circuit 10 to equilibrate the polishing rate across the surface of a semiconductor substrate 11 (abstract). The dummy structures 20 are formed only on a broader region 39 around an active region 38 (Figs 5 and 6, and column 5, lines 27-50). Moreover, *Gilbert* didn't disclose when to stop the polishing, i.e. how long the polishing time should be.

Monitoring a thickness of a film to be polished during a CMP process is very important. If over polished, the films or devices under the film to be

polished may be damaged. If under-polished, the residual film after polishing may seriously affect the electrical properties of devices to be formed. Therefore, it is important to know when to stop CMP.

In independent claim 16 of the present application, dummy structures are formed both on the device region and the test region to achieve good polishing uniformity over the wafer. Furthermore, claims 16 and 19 clearly define when to stop the polishing, that is, when the thickness of the film on the test region is zero, to avoid over-polishing or under-polishing, and the process window is thus increased (Fig. 5).

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). (MPEP 2143.03 All Claim Limitations Must Be Taught or Suggested)

Since Gilbert does not disclose all the limitations of claim 16, the novel features of claim 16 produce new and unexpected results and hence are unobvious and patentable over Gilbert. Accordingly, Applicant respectfully submits that independent claim 16 is allowable over the art of record. In addition, insofar claims 17-18 depend from independent claim 16 and add further limitations thereto, claims 17-18 are also allowable over the art of record.

For independent claim 19, it claims a method of forming shallow trench isolation. In claim 19, dummy structures are also formed on the device region and test region, and the polishing step is stopped when the thickness of the second dielectric layer on the test region is zero. Therefore, even if Gilbert and Huang were to be combined in the manner the Examiner proposed, the proposed combination would not disclose all of the novel physical features of claim 19 as discussed above. Therefore, the novel features of claim 19 produce new and unexpected results and hence are unobvious and patentable over these references.

Accordingly, Applicant respectfully submits that independent claim 19 is allowable over the art of record. In addition, insofar claims 20-25 depend from independent claim 19 and add further limitations thereto, claims 20-25 are also allowable over the art of record.

Reconsideration and withdrawal of this rejection are respectfully requested.

Other cited references of record have been studied, and are found no more relevant to the present invention than the applied art.

In The Drawings

The legend of the horizontal axis in Fig. 5 has been amended to change "film thickness on the device region" to --film thickness on the test region-- to be consistent with the specification, page 9, lines 20-22.

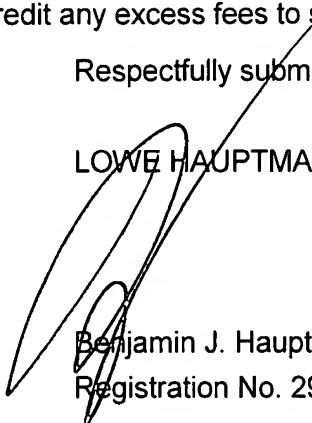
Conclusions

For all of the above reasons, applicants submit that the specification and claims are now in proper form, and that the claims define patentably over the prior art. All claims in the present application are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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